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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,231	05/07/2001	Peter Krulevitch	IL-10581	3998
7590	10/05/2006			EXAMINER SIMONE, CATHERINE A
Alan H. Thompson Assistant Laboratory Counsel Lawrence Livermore National Laboratory P.O. Box 808, L-703 Livermore, CA 94551			ART UNIT 1772	PAPER NUMBER
DATE MAILED: 10/05/2006				

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/851,231  
Filing Date: May 07, 2001  
Appellant(s): KRULEVITCH ET AL.

**MAILED**  
OCT 05 2006  
**GROUP 1700**

Eddie E. Scott  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed June 28, 2006 appealing from the Office action  
mailed April 11, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,574,327

Cammack et al.

11-1996

**(9) Grounds of Rejection**

The following grounds of rejection are applicable to the appealed claims:

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11, 13-15, 17 and 19 stand rejected under 35 U.S.C. 102(b) as being anticipated by Cammack et al. (US 5,574,327).

Regarding claims 11 and 17, Cammack et al. discloses an apparatus having a sealed open microchannel therein comprising an etched open substrate (Fig. 1, element 14), an etched open microchannel in the etched substrate (Fig. 1, element 20 and see col. 6, lines 4-13), an annealed substrate (Fig. 1, element 12) positioned on the etched substrate that covers the etched microchannel in the etched substrate, an annealed open microchannel (Fig. 1, element 22) in the annealed substrate (see col. 2, lines 21-24) over the etched microchannel in the etched substrate, and a bond (Fig. 1, element 16) connecting the etched substrate to the annealed substrate (see col. 6, lines 33-36), wherein the etched open microchannel and the annealed open microchannel comprise the sealed open microchannel (Fig. 1, element 18). Regarding claims 13 and 19, the etched microchannel in the etched substrate and the microchannel in the annealed substrate form a circular microchannel (Fig. 1, element 18; also see col. 5, lines 53-60). Regarding claim 14, the etched substrate and the annealed substrate consist of glass (see col. 5, line 67). Regarding claim 15, the bond comprises fusion or anodic bonding (see col. 6, lines 34-36).

Furthermore, in regard to claim 17, the limitation “produced by the method.....produced by annealing said annealed substrate...” is a method of production and therefore does not

determine the patentability of the product itself. Process limitations are given little or no patentable weight. The method of forming the product is not germane to the issue of patentability of the product itself. See MPEP 2113.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12, 16 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cammack et al. (US 5,574,327).

Cammack et al. discloses an apparatus having a sealed open microchannel therein comprising an etched open substrate (Fig. 1, element 14), an etched open microchannel in the etched substrate (Fig. 1, element 20), an annealed substrate (Fig. 1, element 12) positioned on the etched substrate that covers the etched microchannel in the etched substrate, an annealed open microchannel (Fig. 1, element 22) in the annealed substrate over the etched microchannel in the etched substrate, and a bond (Fig. 1, element 16) connecting the etched substrate to the annealed substrate (see col. 6, lines 33-36), wherein the etched open microchannel and the annealed open microchannel comprise the sealed open microchannel (Fig. 1, element 18).

Although Cammack et al. discloses an annealing temperature of 1000°C (see col. 2, lines 21-23) and a diameter of <100 micron for the sealed microchannels (see col. 2, line 57),

Cammack et al. fails to disclose an annealing temperature in the range of 600° to 800° and the microchannel having a depth of about 10  $\mu\text{m}$  and a width of about 20  $\mu\text{m}$ .

The optimum ranges for the annealing temperature and the width and depth of the microchannel would be readily determined through routine experimentation by one having ordinary skill in the art depending on the desired end results. Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to have modified the annealing temperature in Cammack et al. to be in the 600° to 800° range and modified the microchannel in Cammack et al. to have a depth of about 10  $\mu\text{m}$  and a width of about 20  $\mu\text{m}$ , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art in absence of showing unexpected results. *MPEP 2144.05 (II)*.

Furthermore, regarding claim 18, the limitation "produced by annealing" is a method of production and therefore does not determine the patentability of the product itself. Process limitations are given little or no patentable weight. The method of forming the product is not germane to the issue of patentability of the product itself. See MPEP 2113.

#### **(10) Response to Argument**

##### A. Rejection of claims 11, 13-15, 17 and 19 under 35 U.S.C. 102(b) as anticipated by Cammack et al.

Appellants argue that "The Cammack et al. apparatus shows cavities 20 and 22 formed by etching. The 'half cavities formed by etching' are contrasted with Appellants' 'annealed microchannel produced by annealing'." Appellants then argue "Appellants claim element is an annealed microchannel that is formed by annealing. The Cammack et al microchannel half

cavities are etched and subsequently annealed". Appellants further argue "Appellants claim element is a microchannel formed by annealing and this is different from the Cammack et al 'half cavities that are etched and subsequently annealed'."

However, it is to be pointed out that the method of forming the product is not germane to the issue of patentability of the product itself. See MPEP 2113. Cammack et al. clearly teaches the structure of the presently claimed apparatus having a sealed open microchannel therein. Cammack et al. clearly teaches an etched open substrate (Fig. 1, element 14), an etched open microchannel in the etched substrate (Fig. 1, element 20 and see col. 6, lines 4-13), an annealed substrate (Fig. 1, element 12 and see col. 2, lines 21-24) positioned on the etched substrate that covers the etched microchannel in the etched substrate, an annealed open microchannel (Fig. 1, element 22 and see col. 2, lines 21-24) in the annealed substrate over the etched microchannel in the etched substrate, and a bond (Fig. 1, element 16) connecting the etched substrate to the annealed substrate (see col. 6, lines 33-36), wherein the etched open microchannel and the annealed open microchannel comprise the sealed open microchannel (Fig. 1, element 18). Even if the microchannel half cavities 20 and 22 in Cammack et al. are etched and subsequently annealed, and not formed by annealing as disclosed in Appellants' present invention, the end product is the same in structure as that disclosed in Appellants' present invention. The method of forming the product is not germane to the issue of patentability of the product itself, unless Applicant presents evidence from which the Examiner could reasonably conclude that the claimed product differs in kind from those of the prior art. See MPEP 2113.

Appellants then argue that "when Appellants' claim, patent specification, and prosecution history are used to interpret the claim element 'annealed microchannel' it is clear this element is

formed by annealing, not formed by etching and subsequently annealed as disclosed in the Cammack et al. reference".

Again, it is to be pointed out the method of forming the product is not germane to the issue of patentability of the product itself. See MPEP 2113. Even though the microchannel half cavities 20 and 22 in Cammack et al. are etched and subsequently annealed whereas the annealed microchannel in Appellants' present invention is formed by annealing and not formed by etching and subsequently annealed, the structure of the end product is the same. The method of forming the product is not germane to the issue of patentability of the product itself, unless Applicant presents evidence from which the Examiner could reasonably conclude that the claimed product differs in kind from those of the prior art. See MPEP 2113.

Appellants' further argue the "product-by-process claims 17, 18 and 19 describe the differences between Appellants' invention and the prior art Cammack et al. device. Appellants' claim element is an annealed microchannel that is formed by annealing. The Cammack et al device has microchannels that are etched and subsequently annealed".

However, it is to be pointed out that even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Furthermore, the limitation "produced by annealing" in claim 17 is a method of production and therefore does not determine the patentability of the product itself. Process limitations are given little or no patentable weight. The

method of forming the product is not germane to the issue of patentability of the product itself. See MPEP 2113. Cammack et al. clearly teaches the structure of the apparatus having a sealed open microchannel therein, as claimed in claim 17. Even though the microchannel half cavities 20 and 22 in Cammack et al. are etched and subsequently annealed, and not formed by annealing as disclosed in Appellants' present invention, the structure of the end product is the same. Again, the method of forming the product is not germane to the issue of patentability of the product itself, unless Applicant presents evidence from which the Examiner could reasonably conclude that the claimed product differs in kind from those of the prior art. See MPEP 2113.

B. Rejection of claims 12, 16 and 18 under 35 U.S.C. 103 (a) over Cammack et al.

Appellants' argue "there is no suggestion or motivation to modify the Cammack et al. reference to produce Appellant's invention defined by claims 12, 16 and 18. Since there is no suggestion or motivation to modify the Cammack et al. reference, the Cammack et al. reference does not support a 35 U.S.C. 103(a) rejection of Appellants' claims 12, 16 and 18".

However, as shown previously, Cammack et al. clearly teaches the presently claimed apparatus having a sealed open microchannel therein. Although Cammack et al. fails to disclose an annealing temperature in the range of 600° to 800° and the microchannel having a depth of about 10  $\mu$ m and a width of about 20  $\mu$ m, Cammack et al. teaches an annealing temperature of 1000°C (see col. 2, lines 21-23) and a diameter of <100 micron for the sealed microchannels (see col. 2, line 57). Therefore, the optimum ranges for the annealing temperature and the width and depth of the microchannel would be readily determined through routine experimentation by one having ordinary skill in the art depending on the desired end results. Thus, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to have

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modified the annealing temperature in Cammack et al. to be in the 600° to 800° range and modified the microchannel in Cammack et al. to have a depth of about 10 µm and a width of about 20 µm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art in absence of showing unexpected results. *MPEP 2144.05 (II)*.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner/in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Catherine A. Simone *CAS*

September 25, 2006

Conferees:

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A.U. 1774 9/21/06